

NASA TECH BRIEF



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Controlled Droplet Spray Generator

A new spray generator produces streams of uniform-size droplets issuing at a uniform rate. Uniformity is achieved by applying an oscillatory disturbance to free liquid jets. Jets of varying diameters can be

Figure 2. Capillary tubes are grouped together and supported firmly in the stationary head. Fluid is supplied to each fixed tube through a flexible plastic tube which passes through an oscillating platform. The

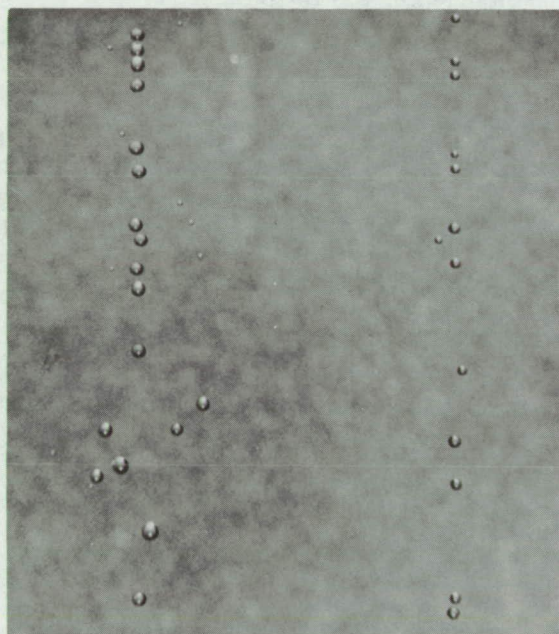


Figure 1a. Without Oscillation

grouped together and oscillated as a group to produce simultaneous streams of uniform-size droplets. The diameter of the droplets in a given stream is approximately twice the inside diameter of the tube from which the stream issues. Figure 1 shows the improvement in droplet uniformity attained by this technique.

A cross-section of the spray generator is shown in

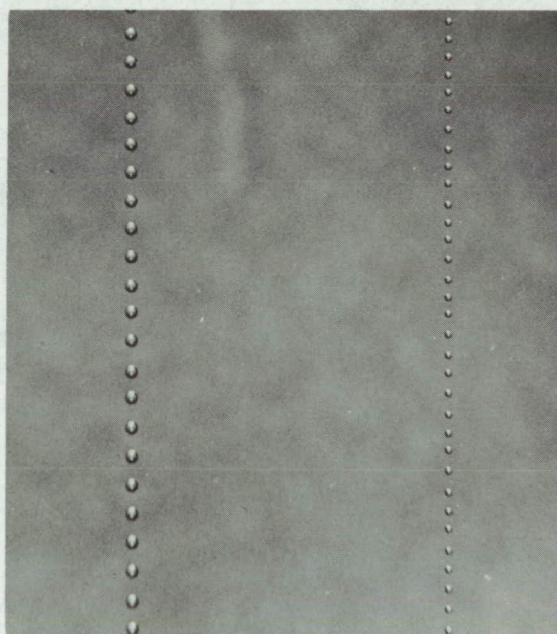


Figure 1b. With Oscillation

mass flow of fluid through each tube is controlled by a metering valve upstream. The streams issue vertically downward from the tubes and the droplets fall freely.

The oscillatory disturbance is introduced into the fluid in the flexible supply tubes and is transmitted to the jets issuing from the fixed tubes. For a given tube diameter and jet velocity, there is a range of

(continued overleaf)

disturbance frequencies which can be sufficiently amplified in the jets to induce the kind of free jet breakup that produces regular droplets.

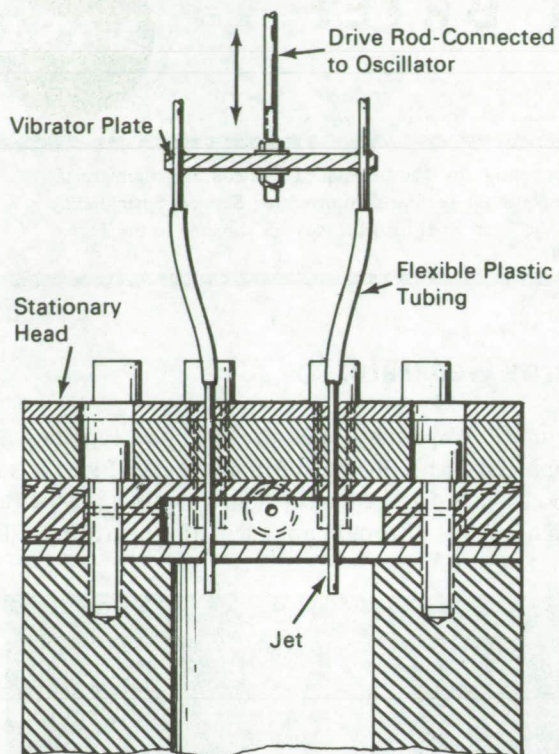


Figure 2. Cross Section of Spray Generator

Notes:

1. This innovation may be of interest to those concerned with sprays in combustion studies and other controlled spray investigations. It may also be of interest for food or chemical processing.
2. The following documentation may be obtained from:

National Technical Information Service
Springfield, Virginia 22151
Single document price \$3.00
(or microfiche \$0.65)

Reference:

NASA-CR-72668 (N70-24312), Two-Phase Detonation Studies Related to Rocket Instability

3. Technical questions may be directed to:

Technology Utilization Officer
Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio 44135

Reference: TSP70-10652

Patent status:

No patent action is contemplated by NASA.

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